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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,513	06/09/2006	Takanori Yamagishi	292380US0PCT	2912

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EXAMINER	
EOFF, ANCA	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
02/17/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/582,513	YAMAGISHI ET AL.	
	Examiner	Art Unit	
	ANCA EOFF	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 17-25 are pending in the application. Claims 1-16 have been canceled.

2. The foreign priority document JP 2003-413627 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.

Claim Rejections - 35 USC § 103

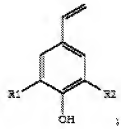
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

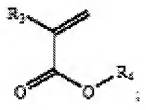
4. Claims 17-22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sounik et al. (US Pg-Pub 2004/0242798) in view of Sehm (US Patent 4,420,610) and in further view of Zampini et al. (US Patent 5,939,511).

With regard to claims 17 and 25, Sounik et al. disclose a method of preparing polymers of enhanced purity, said method including a solvent exchange process. The resultant polymer in solution can be used to prepare a photoresist composition (abstract).

The polymers include a structural unit (I):



(I) (unit (I) in par.0022), in combination with a (meth)acrylate monomer of the formula:



(II) (unit (II) in par.0023), wherein R^3 may be a hydrogen atom or methyl group (par.0034-0036) and R^4 may be a tert-butyl group, methyl-adamantyl or ethyl-adamantyl group (par.0038).

The polymers are equivalent to the resist polymer comprising a repeating unit decomposable by the action of an acid and a repeating unit with a polar group of the instant application. The hydroxystyrene unit (I) is equivalent to the unit with a polar phenolic hydroxyl group and the (meth)acrylate unit (II) with tert-butyl, methyladamatyl or ethyladamatyl group as R^4 is equivalent to the unit with acid-decomposable group.

Sounik et al. disclose that the polymer is dissolved in an alcoholic solvent (par.0021, par.0101) and an additional solvent, such as tetrahydrofuran, methyl ethyl ketone and acetone may be added (par.0101).

The alcoholic solvent comprising an additional co-solvent selected from the group consisting of tetrahydrofuran, methyl ethyl ketone and acetone is equivalent to the solvent (b) of the instant application.

In the solvent exchange step (also defined as Sounik et al. as solvent swap), the polymer is solvent exchanged with an organic solvent which is a photoresist compatible solvent and the alcoholic solvent is removed by distillation (par.0121).The organic solvent may be propylene glycol monomethyl ether acetate , equivalent to the solvent (a) of the instant application.

If the solvent (b) comprises acetone with a boiling point of 56°C, the boiling point of (b) is not higher than the boiling point of propylene glycol monomethyl ether acetate (146°C).

However, Sounik et al. does not specifically disclose the steps of the solvent exchange process.

Sehm disclose a solvent exchange process for polymer slurries (abstract), said slurries including methacrylate copolymers (column 3, lines 6-42). Sehm teaches that in a solvent exchange process, a solvent with lower boiling point is heated to distill off while it is replaced with liquid having higher boiling point (abstract and column 7, lines 38-45).

Since the Sounik et al. disclose that a solvent exchange is used in the polymer purification process, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the steps of the solvent exchange process of Sehm in

the polymer purification process of Sounik et al. (to add the PGMEA to the polymer solution simultaneously with the distillation of methanol).

However, Sounik nor Sehm disclose that the process is performed under pressure.

Zampini et al. disclose a process performed in the purification of novolak resins, wherein said novolak resins are used for preparing photoresist compositions (abstract). Zampini et al. teach that in a solvent exchange process a second solvent (PGMEA) is added to a solution of polymer and a first solvent and the first solvent is distilled under vacuum (column 12, line 51-column 13, line 16).

Since such process is successfully applied for purification of polymers for resist compositions, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform a distillation under vacuum in the solvent exchange process of Sounik modified by Sehm, with a reasonable expectation of success.

Sounik et al. shows that methanol is the alcoholic solvent used to dissolve the polymer (see par.0217, 0230). Sounik et al. also teach that the alcoholic solvent is removed by distillation (par.0121).

Methanol has a boiling point of 64°C so the distillation of methanol occurs at the boiling temperature of 64°C. Therefore, the limitation of the instant application for the temperature being controlled at 70°C or less is met.

Sounik et al. teach that the polymer is substantially pure after the solvent exchange (see step (F) in claim 1). Therefore, it is the examiner's position that that

polymer does not comprise any impurities and the limitations of claims 17 and 25 regarding the amount of impurities are met.

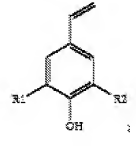
With regard to claims 18-19, Sounik et al. disclose polymers comprising the units (I) and (II) above, wherein:

-unit (I) is equivalent to the polar-group repeating unit of the instant application, the polar group being a phenolic hydroxyl group, and

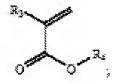
- unit (II) having R^4 a methyl-adamantyl or ethy-adamantyl group is equivalent to the repeating unit decomposable by the action of an acid and comprising an alicyclic skeleton with 5-20 carbons.

With regard to claim 20-21, Sounik et al. disclose that the solvent is used in amounts of about 300 to 2,000 parts, preferably 400 to 1,000 parts by weight per 100 parts by weight of the solids in the chemically amplified positive resist composition. The concentration is not limited to this range as long as film formation by existing methods is possible (par.0124).

With regard to claim 22, Sounik disclose polymers comprising a structural unit (I):



(I) (unit (I) in par.0022) in combination with an acrylate monomer of the formula:



(II) (unit (II) in par.0023), wherein R^3 may be a hydrogen atom or methyl group (par.0034-0036) and R^4 may be a tert-butyl group, methyl-adamantyl or ethyl-adamantyl group (par.0038).

The copolymers of hydroxystyrene and ethyladamatyl methacrylate are identical to the polymers in Example 3 of the specification of the instant application (see page 21 and the tables 1 and 2 on pages 23-24). Absent a record to the contrary, it is the examiner's position that the copolymers of hydroxystyrene and ethyladamatyl methacrylate have the same properties as the copolymers of the instant application (MPEP 2112)

5. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sounik et al. (US Pg-Pub 2004/0242798) in view of Sehm (US Patent 4,420,610) and Zampini et al. (US Patent 5,939,511) as applied to claim 17 and in further view of Burch et al. (US Patent 5,242,991) or Haubold et al. (US Pg-Pub 2003/0032192).

With regard to claims 23-24, Sounik modified by Sehm and Zampini teach the process of claim 17 (see paragraph 4 above) but fail to teach that the solvent (b) may be removed at temperatures of less than 60°C or less than 55°C.

Sounik et al. shows that methanol is the alcoholic solvent used to dissolve the polymer (see par.0217, 0230). Sounik et al. also teach that the alcoholic solvent is removed by distillation (par.0121).

However, it is known in the art that methanol may be distilled under vacuum at room temperature, as shown by Burch et al. in column 7, lines 25-27 and by Haubold et al. in par.0176.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to remove the alcoholic solvent/methanol under vacuum distillation at room temperature, with a reasonable expectation of success.

The room temperature (approximately 25°C) meets the limitations of claims 23-24.

Response to Arguments

6. Applicant's arguments with respect to the new claims 17-25, see pages 5-6 of the Remarks filed on October 22, 2009 have been considered but are moot in view of the new grounds of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. E./
Examiner, Art Unit 1795

/Cynthia H Kelly/
Supervisory Patent Examiner, Art Unit 1795